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Health Consultation

FORD ROAD INDUSTRIAL LANDFILL

ELYRIA, LORAIN COUNTY, OHIO

EPA FACILITY ID: OHD980510002

JANUARY 25, 2002

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

Agency for Toxic Substances and Disease Registry

Division of Health Assessment and Consultation

Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

FORD ROAD INDUSTRIAL LANDFILL

ELYRIA, LORAIN COUNTY, OHIO

EPA FACILITY ID: OHD980510002

Prepared by:

Health Assessment Section
of the Ohio Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

STATEMENT OF ISSUES

The Health Assessment Section (HAS) of the Ohio Department of Health was asked by the United States Environmental Protection Agency to evaluate site conditions and available sampling results at the closed Ford Road Landfill in Lorain County to determine if there are contaminants present at the site that may pose a health threat to residents and visitors living in the vicinity of the landfill. Specifically, HAS was asked to review the Expanded Site Inspection Report prepared for U.S. EPA on January 10, 1994, by PRC Environmental Management, Inc. This health consultation documents the review of the Expanded Site Inspection Report along with providing conclusions and recommendations for future activities at the site.

SITE DESCRIPTION

The Ford Road Landfill is an inactive 15-acre landfill located on Ford Road in Elyria, Lorain County, Ohio. The site is located on the northern edge of Elyria about 1.5 miles northeast of Interchange 8 of the Ohio Turnpike (Figure 1). The site is bordered by Ford Road and the Black River Preserve on the west, the Black River on the east, an intermittent stream and sewer main that is covered with riprap on the north, and a ravine and rural land to the south (Figure 2). The site is not fenced and is accessible from all sides. Several residences are located within one mile of the site with the nearest being about 200 feet northwest of the site.

There are currently no permanent structures on the Ford Road Landfill site; however, three monitoring wells, installed in 1983 by E&E, and a drainage pipe are located along the west bank of the Black River on landfill property (E&E 1983a; PRC 1993). The landfill was originally a ravine located along the east side of Ford Road but has since been filled by waste disposal activities. As a result of waste disposal and capping activities, the surface of the landfill is now at the same elevation as Ford Road, which is approximately 50 to 75 feet above the Black River (PRC 1993).

Surface water at the site currently drains in three directions. Drainage on the north side of the landfill flows into an intermittent stream that drains into the Black River. Surface water runoff from the east side of the site drains directly into the Black River. The south side of the site drains into a ravine that was created by the land filling operation. Runoff from this ravine crosses a former access road and enters a wetland that drains into the Black River.

The Black River is used for recreational fishing in the Elyria area; however, it is unknown if there is any fishing in the immediate vicinity of the Ford Road Landfill.

The Ford Road Landfill site is underlain by clayey silts, silty clays, sandy silts, silt, and clayey sands. The bedrock in the area consists of shales at depths ranging from 9 to 50 feet below ground surface (Herron Consultants, Inc. 1981; E&E 1981). The surface of the landfill is covered with 5 to 8 feet of cover material, including clean fill and clay (PRC 1993). The cover on the landfill was not an EPA approved engineered cap. According to previous consultants,

groundwater flow is expected to be east-northeast toward the Black River (E&E 1981). In order to obtain accurate groundwater flow, additional soil borings or groundwater wells need to be installed.

HAS staff conducted a site visit to the Ford Road Landfill on November 14, 2001. HAS was accompanied by members of the Ohio Environmental Protection Agency, United States Environmental Protection Agency, Elyria City Health Department, Elyria City Law Office, and Haley & Aldrich, the consultant hired by the potentially responsible parties (PRP) at the site. During the site visit, several characteristics of the landfill were noticed. As part of site modifications conducted at the landfill in the mid 1990s, a surface water divide was placed across the center of the landfill. This divide is a large earthen dike that was designed to divert surface water that would naturally enter the Black River from the eastern edge of the landfill to a small tributary on the northern edge of the landfill. It was also apparent that there were some surface modifications made along the eastern edge of the site due to the young age of the trees on the eastern slope of the landfill. Several areas along the slope appear to have settled leaving collapsed pits on the slope. Ash from on-site burning of wastes is visible on the eastern and southern banks of the landfill. While walking on the northern edge of the landfill, several crushed drums were observed protruding from the slope of the ravine. A number of drums, a variety of solid waste - rubber, glass, porcelain, plastic, and solidified paint wastes were exposed at the surface along the southern edge of the landfill. A strong, unpleasant sewer gas smell was noticed while standing near a drainage pipe opening to the Black River at the northern edge of the landfill. No study of landfill gas has been conducted at the landfill to determine if there are high levels of methane or other volatile chemicals in the landfill.

SITE OPERATIONS AND HISTORY

The Ford Road Landfill is currently owned by the Lorain County Metropolitan Parks Department and was formerly operated by BFI (E&E 1980). BFI completed closing activities of the landfill in the mid 1990s. Clean fill material from a local construction site was used for cover material and grading at the site. The closure of the landfill was not completed under EPA supervision or guidelines.

The landfill encompasses approximately 15 acres and was used for the disposal of industrial wastes from the 1950s until 1974. The site was owned by Brotherton Disposal, Inc. (Brotherton), from 1963 until BFI bought all the Brotherton Landfills, including the Ford Road Landfill (BFI 1993).

Several local industries disposed waste in the landfill. The usual procedure was for trucks to back up to the steep banks of the landfill and simply dump their contents over the bank. Wastes were brought to the landfill 24 hours a day, seven days per week (Brotherton 1971). Waste dumped were usually then burned. At least four local industries are known to have disposed of hazardous wastes in the Ford Road Landfill.

BFI disposed of organics, inorganics, heavy metals, sanitary sewage sludges, paint sludges, latex sludges, and small quantities of unknown hazardous wastes. The wastes were generated from construction, paper and printing companies, iron and steel foundries, general chemical, plating and polishing facilities, sanitary and refuse companies, and laboratory and hospital operations (BFI 1981).

Harshaw Chemicals, a subsidiary of Gulf Oil Company, sent more than 700 tons of hazardous materials to the Ford Road Landfill from 1950 until 1974. Materials sent included heavy metals, other inorganic substances, and miscellaneous catalysts and insecticides (OEPA 1980).

The Elyria General Motors facility disposed of unidentified sludges at the Ford Road Landfill between 1963 and 1970. The company dumped an estimated 32,000 gallons of sludge per day, 5 days per week. The sludges contained 5 percent solids and were disposed of in lagoons that contained ash. The type and origin of that ash have not been identified, but are believed to have resulted from the burning of wastes. During the HAS site visit on November 14, 2001, several areas of exposed ash were visible along the eastern and southern edge of the landfill. It is unknown if this ash is part of the former on-site lagoons. The sludge operation accounted for 50 percent of the Ford Road Landfill operations from 1963 until 1970 (Brotherton 1971).

DISCUSSION

Previous Site Investigations

Prior investigations at the Ford Road Landfill site have been conducted by U.S. EPA, Ohio EPA, E&E, and the Elyria City Health Department. The most recent site investigation was completed by PRC in 1993. During the investigation, PRC collected three groundwater samples, two surface water samples, six sediment samples, and two soil samples (PRC, 1994).

Groundwater Sampling & Results

The groundwater wells sampled are located in the ravine along the eastern edge of the landfill adjacent to the Black River (Figure 2). The data is shown in Table D-1 in the back of this document. In the October 14, 2001 site visit conducted by HAS, it was noted that two of the three monitoring wells appear to have been compromised and would no longer be useful for further investigation. Sampling of the monitoring wells in 1993 showed elevated levels of 1,1 dichloroethene and arsenic (PRC 1994). It is unknown whether any of these elevated levels are associated with the landfill. The location of the current monitoring wells is inappropriate to characterize the contamination in the landfill. The landfill is unlined which increases the potential for contaminants to leach into the groundwater or to the surface water of the Black River. Flocculate iron-stained precipitate was observed during the November 14, 2001 site visit at the base of the landfill on the west bank of the Black River and may be leachate derived from the landfill. Additional investigation of the landfill's constituents is necessary to determine the possibility of contaminants reaching a population of concern.

Surface Water Samples

No elevated contaminants were detected in the 1993 surface water sampling event. The data is shown in Table D-2 in the back of this document.

Soil Sampling

Soil samples did not contain contaminants at levels of concern. The data is shown in Table D-3 in the back of this document.

Sediment Sampling

Sediment samples were collected from an intermittent stream located at the northern edge of the landfill, a wetland area at the southeastern edge of the landfill, and from the Black River. The data is shown in Table D-3 in the back of this document. Sediment samples revealed elevated levels of polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCBs). Lead and arsenic were also at elevated levels in the river (PRC 1994). Additional sediment sampling is necessary to determine if contaminants are leaching from the landfill into the Black River.

Pathways of Concern

At this time it appears that the main pathway of concern is contact or ingestion of surface water or sediments in the intermittent tributaries on site or from the Black River. The Black River in the vicinity of the site would appear to support a viable fish population and may be regularly fished by area residents. Eating contaminated fish from the Black River may also be a pathway of concern depending on the current level of contamination in the river and the kinds of chemicals present. Environmental data for the site is extremely limited with the most recent sampling coming in 1993. To adequately assess the threat to human health, it will be necessary to conduct a more thorough investigation of the site to characterize the potential for site contaminants to migrate to the Black River.

Other potential hazards at the site include the physical hazards present along the flanks of the former landfill. The site is unfenced and provides easy access to children or others who may want to have access to the site. Crushed drums and exposed waste were present at the northern and southern edges of the landfill that could pose a physical threat to children playing on the sides of the landfill. Also there were several areas of exposed ash that is of unknown origin that could possibly contain hazardous constituents that may pose a health threat to those who come into contact with it.

CONCLUSIONS

1. Previous environmental investigations indicate that the landfill has impacted sediments in the Black River and an intermittent tributary that leads to the Black River. The site currently poses an indeterminate public health hazard because of the lack of current environmental data and the fact that the available data does not provide a complete picture of the extent of the contamination at the site.
2. Exposed drums and waste on the northern and southern banks of the landfill may pose a physical threat to visitors to the landfill.
3. Visible ash on the northern and southern edge of the landfill may contain hazardous constituents based on prior anecdotal evidence of waste burning at the site.
4. The landfill was not covered with an EPA-approved cap. There are several areas where the landfill surface has settled which may pose a threat for release of contaminants if wastes were to become exposed.

RECOMMENDATIONS

1. A thorough environmental investigation of the site, including surface soil, groundwater, sediment, and landfill gas should be completed at the site to better characterize the levels of hazardous waste in the landfill and the extent of impact on the surrounding environment.
2. Access to the site should be restricted so as to reduce the possibility that children or others could injure themselves on the exposed drums and waste that are present at the landfill.
3. Since contamination is present in the sediments or surface water of the river, OEPA may need to sample fish tissue in the Black River adjacent to the site for site related contaminants, including PCBs.

PUBLIC HEALTH ACTION PLAN

HAS will review any additional data collected at the Ford Road site as it becomes available.

PREPARED BY

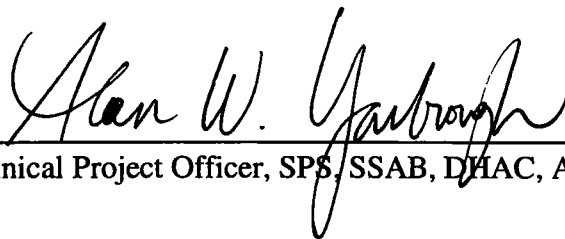
Eric Yates - Environmental Specialist
Robert Frey Ph. D. - Principal Investigator

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- PRC Environmental Management Inc. (PRC). 1993. Expanded Site Inspection Reconnaissance and Sampling Visits at Ford Road Landfill. March 8 and May 18, 1993.
- PRC. 1994. Expanded Site Inspection Report. Ford Road Landfill. Elyria, Ohio. January 10, 1994.

CERTIFICATION

This Ford Road Landfill Health Consultation was prepared by the Ohio Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

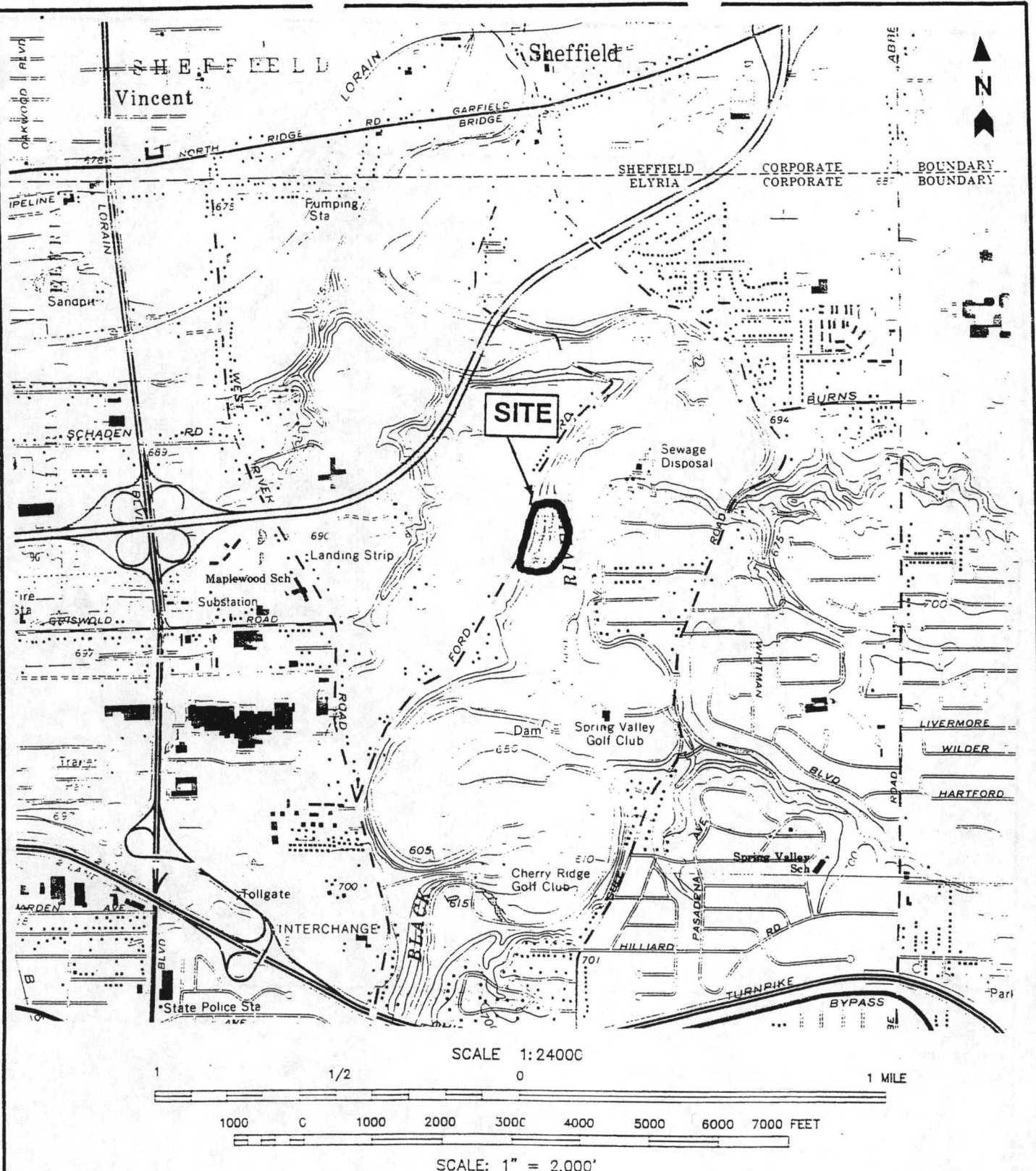


Technical Project Officer, SPS, SSAB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.



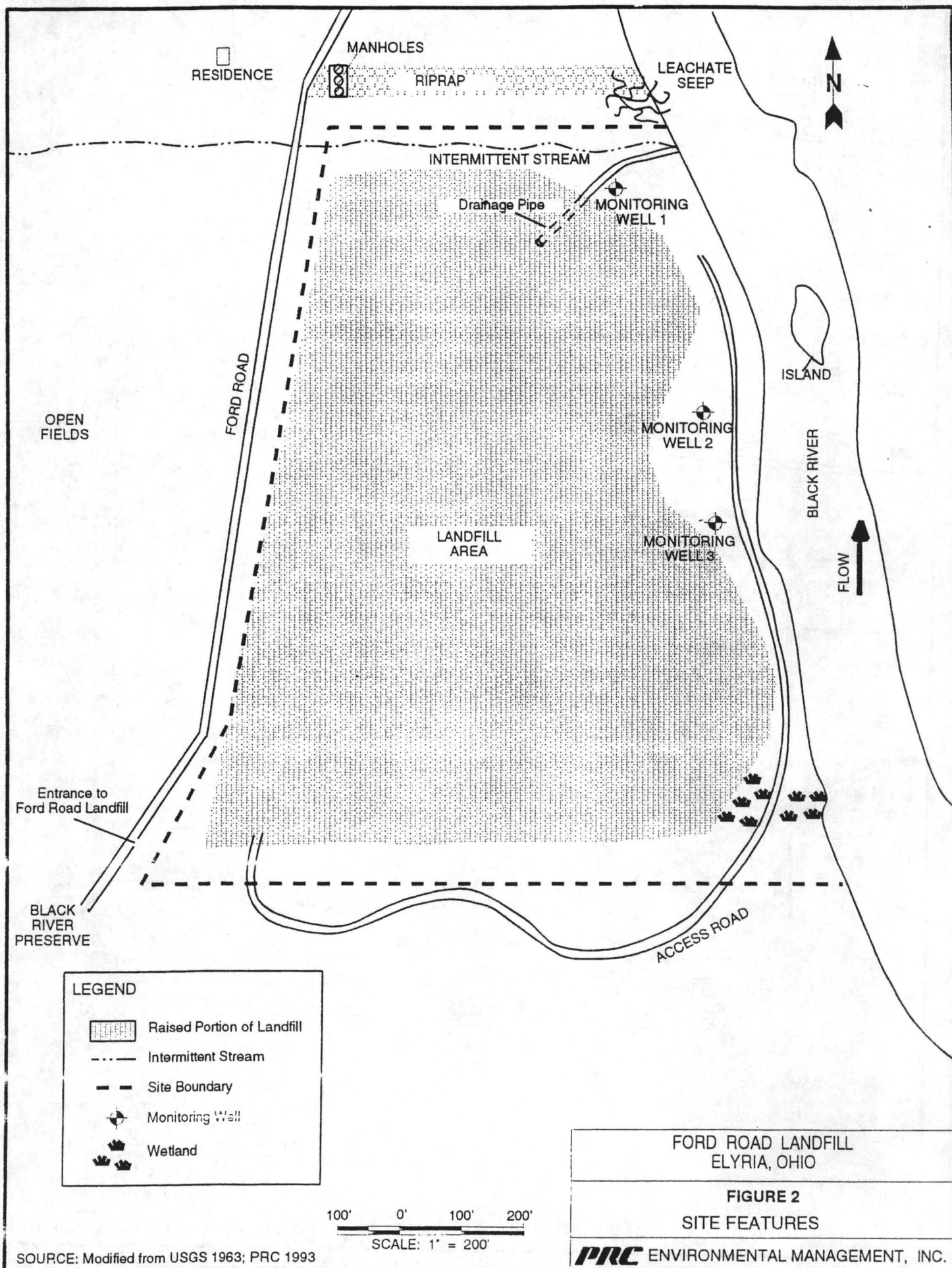
Chief, Superfund Site Assessment Branch, DHAC, ATSDR



QUADRANGLE LOCATION

FORD ROAD LANDFILL ELYRIA, OHIO
FIGURE 1 SITE LOCATION
PRC ENVIRONMENTAL MANAGEMENT, INC.

SOURCE: Modified from USGS 1963.



SOURCE: Modified from USGS 1963; PRC 1993

TABLE D-1
SUMMARY OF MONITORING WELL SAMPLE ANALYSES

FORD ROAD LANDFILL

Sampling Location		MW-01	MW-02	MW-03	MW-3D	MW-B01	MW-TB-01
Date		05/18/93	05/18/93	05/18/93	05/18/93	05/18/93	05/18/93
Time		1745	1915	1517	1517	1615	1615
Organic Traffic Report No.		93ZF53S11	93ZF53S12	93ZF53S13	93ZF53D13	93ZF53R03	93ZF53R04
Inorganic Traffic Report No.		93ZF53S11	93ZF53S12	93ZF53S13	93ZF53D13	93ZF53R03	93ZF53R04
Sample Type		Environmental Groundwater	Environmental Groundwater	Environmental Groundwater	Field Duplicate	Field Blank	Trip Blank
VOLATILE ORGANIC COMPOUNDS	CRQL						
methylene chloride	10	3	2U	2	2U	3	2 J?
acetone	10	23	10 U	12 BU	2U	190 B	64 BU
1,1-dichloroethane	10	21	2U	2U	2U	2U	2U
cis-1,2-dichloroethene	10	2U	1 J?	2U	2U	2U	2U
1,1,1-trichloroethane	10	4 J?	2U	2U	2U	2U	2U
benzene	10	1 J?	2U	2U	2U	2U	2U
<i>Tentatively Identified Compounds (Total)</i>	N/A	5 J?	16 J?	ND	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS	CRQL						
di-n-butylphthalate	10	2 U	2 U	2	2 U	2 U	--
bis-(2-ethylhexyl)phthalate	10	5 BU	17 BJH	5 BU	5 BU	1 JBU	--
<i>Tentatively Identified Compounds (Total)</i>	N/A	12 J?	ND	16 J?	ND	5 J?	--
PESTICIDE/PCB COMPOUNDS	CRQL						
No pesticide/PCB compounds detected							
ANALYTE DETECTED	CRDL						
antimony	60	6	5	2U	5	10	--
arsenic	10	10	24	3	2	2U	--
barium	200	52.9	112	28.7	28.3	7.0 U	--
cadmium	5	0.2U	0.6	0.2U	0.2	0.2U	--
calcium	5,000	163,000	117,000	83,500	83,300	610 U	--
cobalt	50	44.2	7.0 U	7.0 U	7.0 U	7.0 U	--
iron	100	23,600	3,840	1,710	1,760	98.0 U	--
magnesium	5,000	65,200	182,000	57,900	57,500	122 U	--
manganese	15	4,550	1,720	639	634	6.0 U	--
nickel	40	85.9	60.9	24.0 U	24.0 U	24.0 U	--
potassium	5,000	6,100 U	155,000	19,900	19,700	6,100 U	--
selenium	5	3	10U	2U	2U	2U	--
sodium	5,000	169,000	511,000	47,500	47,300	1,200 U	--

TABLE D-1 (continued)
SUMMARY OF MONITORING WELL SAMPLE ANALYSES

FORD ROAD LANDFILL

Notes:

All concentrations are in micrograms per liter ($\mu\text{g/L}$) unless otherwise noted.

CRQL = Contract-required quantitation limit

CRDL = Contract-required detection limit

ND = Not detected

N/A = Not applicable

-- = Not analyzed

GENERAL QUALIFIERS	DEFINITION
U	The compound or analyte was analyzed for but not detected. Associated value is the sample quantitation limit (SQL).
H	Analytical bias is high.
?	Analytical bias is unknown.
COMPOUND QUALIFIERS	DEFINITION
B	Compound was detected in an associated laboratory blank.

TABLE D-2
SUMMARY OF SURFACE WATER SAMPLE ANALYSES

FORD ROAD LANDFILL

Sampling Location		SW-05	SW-02	SW-2D	SW-B01	SW-TB
Date		05/18/93	05/18/93	05/18/93	05/18/93	05/18/93
Time		1700	1320	1320	0800	0800
Organic Traffic Report No.		93ZF53S03	93ZF53S02	93ZF53D02	93ZF53R01	93ZF53R02
Inorganic Traffic Report No.		93ZF53S03	93ZF53S02	93ZF53D02	93ZF53R01	93ZF53R02
Sample Type		Background Black River	Environmental Black River	Field Duplicate	Field Rinsate Blank	Trip Blank
VOLATILE ORGANIC COMPOUNDS	CRQL					
methylene chloride	10	2	2U	2U	2	1 J?
acetone	10	10 U	9 BUJ?	23 J?	65 BU	140 B
<i>Tentatively Identified Compounds (Total)</i>	N/A	ND	ND	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS	CRQL					
bis-(2-ethylhexyl)phthalate	10	2 BU	6 BU	9 BU	5 BU	--
<i>Tentatively Identified Compounds (Total)</i>	N/A	ND	ND	ND	ND	--
PESTICIDE/PCB COMPOUNDS	CRQL					
No Pesticide/PCB compounds detected.						
ANALYTE DETECTED	CRDL					
aluminum	200	172	112	98.0 U	98.0 U	--
barium	200	41.5	41.6	41.4	7.0 U	--
cadmium	5	0.5	0.4	0.5	0.2U	--
calcium	5,000	72,500	71,300	72,600	610 U	--
iron	100	424	344	356	98.0 U	--
lead	3	3	2U	2	2U	--
magnesium	5,000	22,400	22,400	22,600	122 U	--
manganese	15	124	105	107	6.0 U	--
sodium	5,000	35,700	38,100	38,200	1,200 U	--

TABLE D-2 (continued)
SUMMARY OF SURFACE WATER SAMPLE ANALYSES

FORD ROAD LANDFILL

Notes:

All concentrations are in micrograms per liter ($\mu\text{g/L}$) unless otherwise noted.

CRQL = Contract-required quantitation limit

CRDL = Contract-required detection limit

ND = Not detected

N/A = Not applicable

-- = Not analyzed

GENERAL QUALIFIERS	DEFINITION
J	Value is estimated (also indicates a compound that is detected below the CRQL).
?	Analytical bias is unknown.
U	The compound or analyte was analyzed for but not detected. Associated value is the sample quantitation limit (SQL).
COMPOUND QUALIFIERS	DEFINITION
B	Compound was detected in an associated laboratory blank.

TABLE D-3
SUMMARY OF SOIL AND SEDIMENT SAMPLE ANALYSES

FORD ROAD LANDFILL

Sampling Location		SD-07	SD-01	SD-05	SD-02	SD-03	SD-04	SD-06	SD-08
Date		05/18/93	05/18/93	05/18/93	05/18/93	05/18/93	05/18/93	05/18/93	05/18/93
Time		2005	1425	1715	1330	1560	1640	1500	1400
Organic Traffic Report No.		EWG91	EWG85	EWG89	EWG86	EWG87	EWG88	EWG90	EWG92
Inorganic Traffic Report No.		METW91	METW85	METW89	METW86	METW87	METW88	METW90	METW92
Sample Type		Background Int. Stream	Environmental Int. Stream	Background Black River	Environmental Black River	Environmental Black River	Environmental Black River	Environmental Wetland	Environmental Black River
Appearance		Med. Brown	Orange	Med. Brown	Med. Brown	Med. Brown	Med. Brown	Dk. Brown	Orange
VOLATILE ORGANIC COMPOUNDS	CRQL								
acetone	10	11 U	16 JBU	44 B	14 U	12 JBU	17 U	17 U	20 JBU
2-butanone	10	11 U	16 U	12 J?	14 U	15 U	17 U	17 U	20 U
toluene	10	1 J?	16 U	18 U	14 U	15 U	17 U	17 U	20 U
Tentatively Identified Compounds (Total)	N/A	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS	CRQL								
naphthalene	330	380 U	520 U	560 U	100 J?	40 J?	28 J?	140 J?	41 J?
2-methylnaphthalene	330	380 U	520 U	42 J?	250 J?	41 J?	40 J?	61 J?	40 J?
acenaphthylene	330	380 U	520 U	560 U	420 U	500 U	560 U	600 U	27 J?
acenaphthene	330	380 U	520 U	560 U	420 U	500 U	27 J?	100 J?	37 J?
dibenzofuran	330	380 U	520 U	560 U	420 U	500 U	560 U	78 J?	28 J?
fluorene	330	380 U	520 U	560 U	420 U	25 J?	30 J?	110 J?	45 J?
phenanthrene	330	380 U	110 J?	150 J?	200 J?	310 J?	310 J?	1,000	600
anthracene	330	380 U	26 J?	41 J?	29 J?	85 J?	76 J?	200 J?	140 J?
carbazole	330	380 U	520 U	560 U	420 U	42 J?	560 U	160 J?	72 J?
di-n-butylphthalate	330	380 U	520 U	53 J?	420 U	500 U	40 J?	600 U	560 U
fluoranthene	330	380 U	400 J?	270 J?	270 J?	740	490 J?	1,200	1,200
pyrene	330	380 U	360 J?	210 J?	280 J?	910 J?	340 J?	920 J?	920 J?
butylbenzylphthalate	330	380 U	520 U	560 U	420 U	500 U	560 U	600 U	39 J?
benzo(a)anthracene	330	380 U	180 J?	120 J?	130 J?	550	220 J?	530 J?	420 J?
chrysene	330	380 U	220 J?	160 J?	200 J?	720	260 J?	610	570
bis-(2-ethylhexyl)phthalate	330	380 U	140 J?	560 U	160 J?	500 U	560 U	340 J?	240 J?
benzo(b)fluoranthene	330	380 U	180 J?	120 J?	170 J?	870	220 J?	440 J?	490 J?
benzo(k)fluoranthene	330	380 U	200 J?	120 J?	210 J?	770	220 J?	430 J?	500 J?
benzo(a)pyrene	330	380 U	170 J?	120 J?	150 J?	640	240 J?	530 J?	500 J?
indeno(1,2,3-cd)pyrene	330	380 U	120 J?	91 J?	61 J?	470 J?	180 J?	380 J?	390 J?
dibenzo(a,h)anthracene	330	380 U	520 U	560 U	420 U	500 U	560 U	100 J?	560 U
benzo(g,h,i)perylene	330	380 U	76 J?	66 J?	84 J?	240 J?	120 J?	170 J?	200 J?
Tentatively Identified Compounds (Total)	N/A	2,150 J?	12,720 J?	13,500 J?	20,100 J?	13,700 J?	8,760 J?	14,760 J?	14,800 J?

TABLE D-3 (continued)

SUMMARY OF SOIL AND SEDIMENT SAMPLE ANALYSES

FORD ROAD LANDFILL

Sampling Location		SD-07	SD-01	SD-05	SD-02	SD-03	SD-04	SD-06	SD-08
Sample Type		Background Int. Stream	Environmental Int. Stream	Background Black River	Environmental Black River	Environmental Black River	Environmental Black River	Environmental Wetland	Environmental Black River
Appearance		Med. Brown	Orange	Med. Brown	Med. Brown	Med. Brown	Med. Brown	Dk. Brown	Orange
PESTICIDES/PCB COMPOUNDS	CRQL								
delta-BHC	1.7	2.0 U	2.7 U	2.9 U	1.2 JPX?	1.4 JPX?	2.9 U	6.1 U	110 PJ?
endosulfan I	1.7	2.0 U	4.5 ZXJ?	2.9 U	3.3 ZJ?	4.6 ZXJ?	5.0 ZJ?	6.1 U	29 U
dieldrin	3.3	3.8 U	5.2 U	5.6 U	4.2 U	5.0 U	5.6 U	6.3 JPX?	56 U
4,4'-DDE	3.3	3.8 U	5.2 U	5.6 U	4.2 U	5.0 U	5.6 U	17 PXJ?	56 U
endrin	3.3	3.8 U	5.2 U	5.6 U	4.2 U	5.0 U	5.6 U	32 PZJ?	56 U
4,4'-DDD	3.3	3.8 U	2.9 JPXZ?	5.6 U	4.2 U	5.0 U	5.6 U	12 U	56 U
endosulfan sulfate	3.3	3.8 U	5.2 U	5.6 U	4.2 U	4.3 PJ?	5.6 U	12 U	56 U
4,4'-DDT	3.3	3.8 U	5.8 PXJH	5.6 U	2.0 PJH	3.2 XJH	5.6 U	12 U	56 U
endrin aldehyde	3.3	3.8 U	5.2 U	5.6 U	4.2 U	5.0 U	5.6 U	12 PXJ?	56 U
alpha-chlordane	1.7	2.0 U	2.7 U	2.9 U	2.1 U	2.6 U	2.9 U	5.4 JPX?	100 PJ?
gamma-chlordane	1.7	2.0 U	2.7 U	2.9 U	2.1 U	2.6 U	2.9 U	6.1 JPX?	29 U
Aroclor-1242	33.0	38 U	45 J?	56 U	26 PJ?	50 U	56 U	120 U	560 U
Aroclor-1254	33.0	38 U	50 J?	56 U	38 PJ?	50 U	56 U	1,100	560 U
Aroclor-1260	33.0	38 U	52 U	56 U	42 U	41 J?	56 U	120 U	560 U
ANALYTE DETECTED (mg/kg)	CRDL								
aluminum	40	16,400	8,350	11,800	5,880	6,690	10,300	11,300	8,120
antimony	12	4.1 UNJL	5.4 UNJL	5.6 UNJL	4.3 UNJL	18.8 NJL	19.8 NJL	6.6 UNJL	6.5 UNJL
arsenic	2	7.5	10.0	8.5	9.1	45.4	6.9	8.8	6.8
barium	40	58.9	91.4	96.3	39.6 B	159	88.8	701	64.7 B
beryllium	1	0.65 B	0.72 B	0.69 B	0.58 B	0.54 B	0.67 B	0.59 B	0.64 B
cadmium	1	0.31 U	2.5	57.5	3.0	32.6	10.8	2.1	4.6
calcium	1,000	1,520	14,800	2,220	3,530	2,570	2,500	66,800	8,610
chromium	2	21.5 NJL	207 NJL	96.4 NJL	56.3 NJL	57.4 NJL	134 NJL	137 NJL	197 NJL
cobalt	10	6.9 B	15.4	10.9 B	11.6	10.4 B	9.1 B	10.4 B	8.1 B
copper	5	25.0 *J+	148 *J?	43.2 *J?	58.0 *J?	75.2 *J?	81.7 *J?	72.4 *J?	137 *J?
iron	20	31,900	25,600	29,000	18,100	37,900	25,400	31,700	23,400
lead	0.6	14.8 *	62.6 *	58.2 *	27.2 *	52.9 *	78.5 *	298 S*	54.4 S*
magnesium	1,000	3,440	4,710	3,750	2,310	2,360	3,130	6,920	4,170
manganese	3	195	1,430	153	193	134	126	862	217
mercury	0.1	0.06 U	0.10 B	0.34	0.09 B	0.14	0.69	0.15 B	0.17
nickel	8	21.7	135	40.7	61.1	28.1	44.3	111	112
potassium	1,000	1,240	1,470	1,640	1,500	987 B	1,370 B	2,150	1,430 B
selenium	1	0.63 UNJL	0.87 UN	0.91 UN	2.2 NJL	2.8 NJL	4.9 NJL	1.2 BWNJL	1.0 BN
silver	2	2.7	2.4 B	3.5	1.9 B	3.6	3.1 B	2.4 B	2.0 B
sodium	1,000	92.3 NJ+	478 B	154 BNJ+	149 B	161 BJ+	204 B	976 B	325 B
thallium	2	0.29 B	0.60 B	0.84 B	0.76 B	0.41 B	0.49 B	0.43 U	0.40 U
vanadium	10	29.8	18.9	26.2	31.7	18.1	26.6	23.0	22.8
zinc	4	61.4	196	293	141	290	295	1,120	251
cyanide	10	0.57 U*	0.92 *	0.79 U*	0.57 U*	0.74 U*	0.86 U*	0.96 U*	0.87 U*

TABLE D-3 (continued)
SUMMARY OF SOIL AND SEDIMENT SAMPLE ANALYSES

FORD ROAD LANDFILL

Notes:

All concentrations are in micrograms per kilogram ($\mu\text{g/kg}$) unless otherwise noted.

CRQL = Contract-required quantitation limit

CRDL = Contract-required detection limit

ND = Not detected

N/A = Not applicable

-- = Not analyzed

GENERAL QUALIFIERS	DEFINITION
J	Value is estimated (also indicates a compound that is detected below the CRQL).
H	Analytical bias is high.
L	Analytical bias is low.
?	Analytical bias is unknown.
U	The compound or analyte was analyzed for but not detected. Associated value is the sample quantitation limit (SQL).
COMPOUND QUALIFIERS	DEFINITION
P	Variance between GC columns was greater than 25 percent in pesticide or Aroclor (PCB) analyses. The lower value is reported.
B	Compound was detected in an associated laboratory blank.
X	Reported compound coelutes with PCB Aroclor peaks on one or both analytical columns.
Z	Confirmation of this compound is questionable.
ANALYTE QUALIFIERS	DEFINITION
B	Value is below the CRDL.
N	Matrix spike percent recovery values were outside of control limits.
W	Furnace AA post-digestion spike recovery values were outside of control limits.
*	Duplicate relative percent difference values were outside of control limits.
S	Analyte concentration was determined by Method of Standard Additions (MSA).
+	Correlation coefficient for MSA was less than 0.995.